



NASA Procedural Requirements

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CHAPTER 3: Mission Management Aircraft Operations

(Interim Revision to Chapter 3 of NPR 7900.3, Aircraft Operations Management, NM 7900-30)

3.1. Purpose

This chapter establishes procedures and guidelines for management, utilization, operation, and control of NASA Mission Management Aircraft (MMA) in accordance with NPD 7900.4, Aircraft Operations Management, and OMB Circular A-126, Improving the Management and Use of Government Aircraft.

3.2. Guidelines

3.2.1. NASA MMA shall be operated in accordance with the procedures specified in FAR Part 91, subparts A and B, and with the provisions of this Chapter, whichever is more restrictive. Procedures of the International Civil Aviation Organization (ICAO) shall apply in lieu of FAR Part 91 on international flights.

3.2.2. MMA are used primarily to transport management and staff personnel to provide direction, coordination, and oversight in support of NASA's mission. When not otherwise scheduled, the aircraft may be used for the transportation of other personnel on official Government business when the itinerary, schedule, cost, or other factors make the use of those aircraft more advantageous to the Government than other methods of transportation.

3.2.3. Every effort shall be made to minimize flights that are duplicative, require excessive deadheading, involve long, unproductive layovers, or involve short stage-lengths. Whenever practicable, intercenter airlift requirements shall be combined.

3.2.4. Each person traveling aboard NASA MMA must be on official business and have either a NASA travel authorization approved in accordance with NASA directives or a travel authorization approved by another Federal agency or congressional committee. Travel authorized by another Federal agency or congressional committee must be approved by an Official-in-Charge of a Headquarters Office, a Director of a Center, or the appropriate designee. In exceptional circumstances, when approved by an Enterprise Associate Administrator or Center Director, other persons may be permitted to travel aboard NASA MMA for emergency or humanitarian purposes or on a reimbursable basis.

3.2.5. All passengers shall be manifested on NASA Form 1269, Flight Itinerary and Passenger Manifest, or an authorized substitute form. Prior to departure, the PIC shall certify the accuracy of the manifest and file a copy with a responsible ground agency such as a military, civil, or NASA operations office. If a responsible NASA official acting as a ground coordinator for the flight is aware of all changes to the manifest, the PIC is relieved of this requirement. The publication of specific local procedures is required to ensure that there is always a readily available accurate list of personnel aboard NASA aircraft.

3.2.6. NASA MMA shall be designated by the Associate Administrator for Management Systems and Facilities.

3.2.7. NASA MMA are public aircraft as defined by 49 U.S.C. 40102 (37), but are operated as civil aircraft when carrying passengers. Maintenance standards shall meet those required for retention of Federal Aviation Administration (FAA) airworthiness certification. The Airworthiness Certificate shall be displayed per FAR 91.203 (a) and (b). MMA shall be operated and maintained in accordance with FAR Parts 21, 39, 43, 61, 65, and 91.

3.3. Classification of Aircraft Use

3.3.1. Required Use is defined in Office of Management and Budget (OMB) Circular A-126 as "the use of Government aircraft because of bona fide communications or security needs of the Agency or exceptional scheduling requirements." Its use shall be controlled only by the Administrator or higher authority. Normally, NASA does not use this travel classification.

3.3.2. Mission Required use is defined as the use of Government aircraft in the discharge of an agency's official responsibility. This includes, but is not limited to, space and science applications, space flight mission support, and aeronautical research. Mission Required use does not include official travel to give speeches, to attend conferences or meetings, or to make routine site visits. Although not required by OMB Circular A-126, NASA policy requires these trips to be cost-justified, using the computation portion of NASA Form (NF) 1653 to ensure that other potentially cheaper travel options are considered. Examples of Mission Required use include the following:

3.3.2.1. Support for Flight Readiness Reviews, Launch-2 activities, Launch-1 activities, and Launch or Landing activities of current Shuttle Launches.

3.3.2.2. Support for launches of other NASA-related payloads (e.g., Ariane launches, Delta launches).

3.3.2.3. Support for Launch Recovery operations.

3.3.2.4. Support for In-Space operations.

3.3.2.5. Support for activities directly related to approved NASA programs or projects (e.g., payload operations, scientific missions, astronaut training, high speed research, advanced subsonic transport research).

3.3.3. Other Official Travel is defined as use of a Government aircraft for all other travel to conduct Agency business. Travel on NASA aircraft by NASA officials in this category must be authorized in advance on a trip-by-trip basis. The travel authorization must be reviewed for compliance with 41 CFR 101-37 and OMB Circular A-126 by the General Counsel or principal deputy for Headquarters flights or Chief Counsels or their principal deputies for Center flights. Examples of Other Official Travel include the following:

3.3.3.1. Support to officials traveling for the specific purposes of giving speeches, keynote addresses.

3.3.3.2 Support to officials to accept significant awards at banquets, balls, dinners, luncheons.

3.3.3.3. Support to officials making routine site visits.

3.3.3.4. Support to NASA-sponsored meetings such as NASA advisory committees, councils and board meetings, Equal Employment Opportunity conferences, and contractor conferences.

3.3.4. Authorization for Other Official Travel. Travel on NASA aircraft by NASA officials in the "Other Official Travel" category shall be authorized only as follows:

3.3.4.1. When no commercial airline or aircraft (including charter) service is reasonably available (i.e., able to meet the traveler's departure and/or arrival requirements within a 24-hour period), unless the traveler demonstrates that extraordinary circumstances require a shorter period to effectively fulfill Agency requirements. When using "No commercial airline or aircraft service is reasonably available" as the rationale to justify the use of NASA aircraft, actual airline schedule information must be provided as part of the aircraft request.

3.3.4.2. When a flight is being made to support Mission Required travel, secondary use of the aircraft for additional Other Official Travel may be presumed to result in cost savings. Therefore, a cost comparison of such additional "Other Official" travelers is not required.

3.3.5. Records of all MMA missions shall be retained for at least 2 years.

3.3.6. Use of program support aircraft for mission management purposes, regardless of travel classification category, shall follow the same requirements as use of MMA, to include compliance with 41 CFR 101-37 and OMB Circular A-126, development of a cost justification using NF 1653, and obtaining authorization approvals.

3.4. Approval of Flights

3.4.1. The Center Director is responsible for the approval of MMA requests submitted for use of the Center's assigned aircraft. The authority may be delegated to a level no lower than a Directorate. Center approving officials shall ascertain that, prior to each flight approval, the purpose of the trip is for official business as described in paragraph 3.3 and one of the following criteria is satisfied:

3.4.1.1. No commercial aircraft or airline service is reasonably available to effectively fulfill the transportation requirement.

3.4.1.2. The variable cost of using MMA is not more than the cost of using commercial aircraft or airline service. The cost of using commercial aircraft or airline service includes, for example, the cost of any additional travel and employee's lost work time.

3.4.1.3. The flight is being made to meet aircraft maintenance or aircrew training requirements.

3.5. Responsibilities Associated with Mission Management Aircraft

3.5.1. The Associate Administrator for Management Systems and Facilities is responsible for the following:

3.5.1.1. Approving and delegating approval authority for policies and other matters involving NASA MMA and for ensuring that the number of aircraft and their capacity to carry passengers and cargo does not exceed that required to meet Agency missions.

3.5.1.2. Coordinating Agency planning efforts involving acquisition, assignment, or disposition of MMA with Institutional and Enterprise Associate Administrators and Center Directors.

3.5.1.3. Continually reviewing MMA requirements, utilization, and associated costs.

3.5.2. Center Directors are responsible for the safe and efficient operation and utilization of assigned aircraft. They shall ensure that aircraft are used properly and that the functions, including contract functions, performed by their aircraft comply with NASA, FAA, OMB, and other Federal requirements, policies, and procedures. Center Directors should establish more restrictive standards when local conditions dictate. In addition, they are specifically responsible for the following:

3.5.2.1. Ensuring compliance with 41 CFR 101-37 and OMB Circular A-126.

3.5.2.2. Designating a Senior Management official who shall be responsible for approving the use of Agency aircraft for mission management purposes.

3.5.2.3. Designating crew members who operate or fly in Center aircraft.

3.5.2.4. Annually reviewing and documenting the Center's continuing need for MMA and the cost-effectiveness of aircraft operation, as reflected in the NASA Financial Management Manual. Content of this review should include, in narrative format, a comparison of the past years' use with future requirements. Upon completion of the annual review, a copy should be forwarded to the Aircraft Management Team (HQ/Code JLP). When possession of an aircraft can no longer be justified, Center Directors shall identify such aircraft for reassignment or disposal, as appropriate.

3.5.3. The Lead, Aircraft Management Team, is responsible for the following:

3.5.3.1. Providing oversight, functional management, and direct staff support to the Administrator concerning Agencywide policies, procedures, and guidelines for the management and use of MMA.

3.5.3.2. Developing and coordinating plans for the acquisition, assignment, and disposition of MMA in accordance with applicable Federal guidelines.

3.5.3.3. Developing standard Agencywide maintenance and operating requirements and policies, including minimum training and qualification requirements for aircrew and maintenance personnel.

3.5.3.4. Coordinating periodic meetings with Center Aircraft Operations Chiefs and Maintenance Chiefs to review and update Agencywide operations and maintenance requirements, policies, and procedures.

3.5.3.5. Working with subpanels of the IAOP in establishing airworthiness review procedures for MMA.

3.5.3.6. Reviewing and approving modifications or alterations to MMA.

3.5.3.7. In conjunction with the Chairman, IAOP, coordinating and participating in the conduct of operational reviews to ensure the adequacy and standardization of procedures, aircrew training and qualification programs, and aircraft maintenance and inspection programs at Centers operating MMA.

3.5.3.8. Evaluating cost and utilization data for MMA and for providing a periodic summary analysis of all administrative cost and utilization data to the Associate Administrator for Management Systems and Facilities.

3.5.3.9. Providing Centers with guidance and average variable cost data for use in accomplishing cost comparisons.

3.5.4. The Intercenter Aircraft Operations Panel (IAOP)

3.5.4.1. The IAOP performs an Agencywide coordination and communication function to recommend requirements,

policies, and operational improvements that can be used by the NASA Centers to improve local operations policies and procedures, and by the AMT to improve Agency policies, procedures, and guidelines.

3.5.4.2. For each type of MMA, the Chairperson may establish Operations and Maintenance Subpanels with responsibility for standardizing aircrew and maintenance procedures, for establishing aircrew and maintenance training/qualification standards, and for conducting airworthiness reviews.

3.5.4.3. Subpanel membership shall be composed of appropriate Chiefs of Aircraft Operations and Chiefs of Aircraft Maintenance or their designees, as well as a representative from the NASA Headquarters Aircraft Management Team who shall act as permanent Executive Secretary.

3.5.4.4. Subpanels shall be convened in formal meetings at least annually; however, the subpanels shall act as standing committees subject to call by the Chairperson to review urgent business. Informal meetings may be conducted by teleconference.

3.5.4.5. Subpanels, with IAOP Chairperson concurrence, shall forward their recommendations through the Aircraft Management Team to the Associate Administrator for Management Systems and Facilities for final approval. Headquarters-approved recommendations shall be considered directive in nature.

3.5.5. All Crew Members

3.5.5.1. Maintaining the highest standards of safety shall be the primary concern of all crew members. Other concerns, such as passenger service, courtesy, promptness, and reliability are important but must always be secondary to safety. All crew members shall comply with the provisions set forth in this NPG and with FAA, Original Equipment Manufacturer (OEM), and other applicable directives, regulations, and instructions.

3.5.6. An Aircraft Commander shall be designated as PIC and charged with the responsibility of conducting each NASA mission management flight.

3.5.6.1. The PIC is responsible for exercising complete authority, without limitation, over the command and supervision of assigned crew members during flight and crew duty time.

3.5.6.2. The PIC is solely responsible for accomplishing the mission assigned to the aircraft, for all facets of its operations, and for exercising final authority over the safety of the aircraft and its passengers. The PIC shall make the decision to delay or divert a flight for operational reasons such as weather, aircraft conditions, or pilot fatigue. The PIC shall not be overruled by other persons embarked. A decision by the PIC to delay or divert a flight for the above reasons on the grounds of safety shall not be the basis for disciplinary action.

3.5.7. Second-in-Command (SIC). The pilot assigned to duty as SIC during flight shall be designated as either an aircraft commander, first pilot, or second pilot. It is the SIC's responsibility to assist the PIC and to be able to assume command in the event of the PIC's absence or incapacitation.

3.5.7.1. A first pilot shall be a highly qualified copilot who may, at the discretion of the PIC, fly the aircraft from either the left or right seat on both passenger and training missions.

3.5.7.2. A second pilot shall be a qualified copilot who may, at the discretion of the PIC, fly from the left seat on missions when no passengers are on board, such as ferry or training missions. A second pilot may not make takeoffs or landings from either seat with passengers on board.

3.6. Operations

3.6.1. NASA MMA are public aircraft, as defined by 49 U.S.C. 40102 (37), but are operated as civil aircraft when carrying passengers.

3.6.2. Program Support aircraft used as MMA shall meet the FAA certification standards required of MMA.

3.6.3. Airworthiness of NASA MMA shall, as a minimum, meet the standards set forth in the Federal Aviation Regulations for similar business type aircraft. MMA shall be maintained as required for retention of FAA airworthiness certification.

3.6.4. The cost of operation and the utilization of MMA shall be reported in accordance with Financial Management Manual 9353-6 (RCS-10-0000-00271).

3.7. Use of Program Support Aircraft for Mission Management Purposes

3.7.1. Program support aircraft directly support NASA programs and projects, while MMA are used to transport management and staff personnel so that they may more efficiently accomplish their oversight, direction, and communications roles.

3.7.2. The use of program support aircraft for mission management purposes shall be restricted to exceptional circumstances. This policy may be deviated from on an exception basis after all of the following requirements have

been addressed:

3.7.2.1. Such use shall not conflict with program support functions.

3.7.2.2. Use only when MMA are not readily available or when such use would be impractical; e.g., when using an available MMA would create excessive deadheading or would exceed crew duty restrictions.

3.7.2.3. Subject such use to the same cost comparisons required for MMA flights unless the usage is an "add on" to a previously scheduled program support flight, such as a returning flight which would otherwise have empty seats. For purposes of this paragraph, incremental (variable) costs may be used to perform cost comparisons.

3.7.2.4. Use only with the approval of the Center Director and the Associate Administrator for Management Systems and Facilities.

3.7.2.5. Document the justification for and approval of each use and retain the documentation for 2 years. Submit a summary report of such usage to the Office of Management Systems and Facilities semiannually.

3.8. Waivers and Supplements

3.8.1. Waivers. When deviations from this NPG are necessary, submit requests for waivers from the Center Director through the appropriate Program Office to the Lead, Aircraft Management Team, NASA Headquarters. Prior written approval from the Associate Administrator for Management Systems and Facilities shall be obtained before implementing procedures that are less restrictive than those contained in this directive.

3.8.2. Supplements. Appendix I is reserved to provide Centers with a means for establishing, within a single document, local guidance appropriate to MMA operations. Copies of supplements should be provided to the Lead, Aircraft Management Team, for review and, if appropriate, distribution to other users of this NPG.

3.9. Flight Crew Qualifications

3.9.1. Designation. Prior to assigning personnel to flight crew duties on NASA MMA, the requirements contained in this chapter must be accomplished; the crew member must be designated in writing to the respective crew position; and required training must be completed and documented in the individual's training file.

3.9.2. Training File. A training file shall be maintained for each flight crew member. This file shall contain all documentation pertaining to crew qualification and training. The documents may be retained by the crew member upon termination of the crew members assignment. The file shall contain the following minimum documentation:

3.9.2.1. Qualifications. File shall contain copies of certificates of professional and medical qualifications; e.g., copies of pilots or mechanics licenses and shall contain a copy of the letter designating the individual to his/her current crew position.

3.9.2.2. Ground Training. File shall contain a list of ground training accomplishments (including simulator training) indicating dates, location, and amount of training. A record of refresher training must be maintained for the past 2 calendar years.

3.9.2.3. Flight Training. File shall contain a list of flight training accomplishments and flight evaluations for the past 2 calendar years.

3.9.3. Prerequisites, All Pilots. Possess an FAA First Class Medical Certificate issued within the past 12 months by a NASA-approved medical examiner.

3.9.4. Prerequisites, Aircraft Commanders. Possess an FAA Airline Transport Pilot (ATP) Certificate with a type rating, if appropriate, in the aircraft assigned, and have been certificated a pilot for at least 5 years. To be considered for an aircraft commander position, the applicant must meet the following minimum flight experience requirements:

3.9.4.1. 2500-pilot hours (500 multiengine).

3.9.4.2. 200-pilot hours in type.

3.9.4.3. 200-instrument-pilot hours (100 actual).

3.9.4.4. In exceptional circumstances, the 200-pilot hours in type requirement may be reduced if the pilot is qualified in similar type. The justification shall be submitted to the Lead, Aircraft Management Team, NASA Headquarters.

3.9.5. Prerequisites, First Pilots. Possess an FAA Airline Transport Pilot Certificate with a type rating in the aircraft assigned, if appropriate, and have flown at least 50 hours in type.

3.9.6. Prerequisites, Second Pilots. Possess an FAA Commercial Pilot Certificate with appropriate category, class, and instrument ratings, and have flown at least 10 hours in type, 8 of which may be in an approved simulator.

3.9.7. Flight Examiners. Pilot flight examiners shall be selected by the chief of flight operations from highly qualified pilots who have demonstrated the skill, maturity, and temperament to perform evaluator duties.

3.9.8. Instructor Pilots. Instructor pilots shall be selected by the chief of flight operations from highly qualified aircraft commanders who have demonstrated the skill, maturity, and temperament to perform instructor duties.

3.9.9. Flight Maintenance Technician. Flight maintenance technicians must possess an FAA Airframe and Powerplant (A&P) Certificate. They must possess a valid FAA Third Class Medical Certificate issued within the past 12 months by a NASA-approved medical examiner.

3.10. Crewmember Training

3.10.1. The MMA training program is established to ensure that each crew members is adequately trained to perform assigned duties safely and proficiently. To the extent practical, procedures training shall be standardized for each type of MMA.

3.10.2. The NASA Headquarters Aircraft Management Team, through the appropriate MMA Operations Subpanels of the IAOP, shall be responsible for review and approval of standardized aircraft operating procedures.

3.11. Ground Training

3.11.1. Survival Training. Each crew member shall receive basic survival training on a one-time basis. Additional survival training may be required by appropriate Center management for those crew members engaged in frequent over water or remote area flights. Appropriate training received prior to NASA employment, such as military survival training courses, may be credited for this requirement. Newly assigned personnel, with no previous survival training, must complete this requirement within 6 months of being assigned to flight crew duties. Pilots shall not be designated PIC until this requirement is satisfied.

3.11.2. Physiological Training. Prior to initial designation, crew members shall receive instruction in the physiological aspects of high altitude flight including altitude chamber indoctrination. Refresher training academics shall be accomplished every 5 years. Refresher altitude chamber indoctrination is optional. Altitude chamber training received prior to initial designation shall satisfy this requirement.

3.11.3. Emergency Egress Training. Prior to initial designation and annually thereafter, each crew member shall receive emergency egress training on each type of aircraft assigned. Training should include instruction on the location and operation of normal and emergency exits and cabin emergency equipment such as fire extinguishers and life vests.

3.11.4. Aircraft Systems Training. Each crew member shall complete an approved formal course of instruction in the type aircraft to be flown, including a study of the systems and procedures applicable to the individual's crew position. The term formal course is defined as one that is provided by a manufacturer, a commercial activity specializing in pilot training, or other organization approved by the appropriate MMA Operations Subpanel.

3.11.4.1. Initial Training. Prior to initial designation, each crew member shall complete a formal systems training course consisting of a minimum of 20 hours of academic training.

3.11.4.2. Refresher Training. A formal systems training course is required every 6 months for pilots and every 18 months for flight maintenance technicians. The course shall consist of a minimum of 7 hours of academic training. At the discretion of the Chief of Aircraft Operations, this requirement may be modified for aircraft commanders who have at least 3 years experience and 500-hours flying time in the type of aircraft to which assigned. In these instances, a 7-hour local refresher ground training course may be substituted for alternate formal courses.

3.12. Flight Training Phase

3.12.1. Flight training is designed to provide the crew member with hands-on experience under controlled conditions. Flight training shall be conducted under the supervision of a NASA-designated flight examiner or instructor pilot or an FAA-certificated flight instructor either in an approved simulator or in an aircraft. Flight training, except that which is associated with transportation procedures, shall not be conducted while passengers are on board.

3.12.2. Initial Pilot Training. Prior to initial designation, each pilot shall receive a minimum of 10 hours of flight training, 8 hours of which may be conducted in a simulator.

3.12.3. Refresher Pilot Training. In each 6-month period, pilots shall receive a minimum of 6 hours flight or simulator training. At least one-half of this training shall be completed in the pilot's (left seat) position. Because of the safety and efficiency provided by modern visual, motion simulators, maximum use should be made of these facilities to satisfy this training requirement. With the approval of the Chief of Aircraft Operations, one of the semiannual flight or simulator training requirements may be waived for pilots with 3 years and 500 hours' experience in type and for

temporary pilots serving in a second pilot capacity. This can be done only after all other applicable requirements of this directive are met and that the temporary pilot successfully completes a proficiency and instrument competency check in type given by an approved NASA flight examiner within the preceding 6 months.

3.12.4. Flight Maintenance Technician Training. Maintenance technicians perform in-flight duties involving , passenger safety aboard certain NASA mission management aircraft, such as Gulfstream I and III aircraft, as required by FAA regulations. Prior to initial designation, each maintenance technician shall receive training in such areas as traffic awareness and "see-and-avoid" techniques, aircraft servicing, weight and balance, and passenger care. This training may be conducted on a regular passenger mission under the supervision of a fully qualified flight mechanic or aircraft commander. Initial training shall consist of at least two passenger missions. At least one mission shall include an overnight stop away from home station.

3.13. Overdue Training

With the exception of simulator training, which shall have a 2-month grace period, refresher ground and flight training shall be considered overdue if not completed by the end of the month in which it is due. Crew members with overdue training shall not be used as a required crew member on any passenger missions until the required training is completed.

3.14. Recent Experience

To ensure all crew members have the opportunity to exercise their aeronautical skills and thereby maintain the proficiency level to which they have been trained, the following minimum recent experience requirements are established:

3.14.1. Pilots - Recent Experience. Table sets forth the recent pilot flight experience requirements:

Requirement	Pilot In Command		First Pilot		Second Pilot	
	All	In	All In Types	Type	All In Types	Type
Previous 90 Days						
Pilot/Copilot Hours	40	10	30	8	20	5
Take Off (Day)	6	3	6	3	6	3
Landings (Day)	6	3	6	3	2	1
Take Off (Night)	3	1	3	1	1	--
Landings (Night)	3	1	3	1	1	--
Previous 6 Months						
Actual/Simulated Inst. Hrs. (3 hours in category)	6	3	6	3	6	3
Approaches	6	3	6	3	6	3

3.14.2. Table Notations

3.14.2.1. Requirements under "All Types" are not limited to MMA.

3.14.2.2. Total "Pilot/Co-pilot Hours" may include simulator hours.

3.14.2.3. Instrument hours, approaches, and landings (including night landings) may be accomplished in an approved visual, motion simulator. Approaches should be evenly balanced between precision and nonprecision.

3.14.2.4. Pilots with current qualifications in a program support aircraft that is also FAA-certified for MMA use, but infrequently used for that purpose, may perform the duties of PIC and SIC on that aircraft.

3.14.2.5. At Centers that operate multiple aircraft of higher performance than the MMA, and where such aircraft have annual or semiannual simulator and other similar requirements (night landings, approaches, and hours), pilots shall be considered to have met the recent experience requirements of paragraph 3.14.1.

3.14.3. Flight Maintenance Technician. To maintain currency, flight maintenance technicians must have flown at least three passenger missions each calendar quarter or they shall be accompanied by a current flight maintenance technician.

3.15. Overdue Recent Experience

The following requirements apply to pilots overdue the recent experience provisions of paragraph 3.14:

3.15.1. Total Pilot Hours. Aircraft commanders and first pilots who do not meet the 90-day total hour requirements, but are otherwise current, shall increase all instrument approach minimums by 200 feet and 1/2 mile visibility (or the Runway Visual Range equivalent). In no case may the resulting minimums be less than a 400-foot ceiling and 3/4 mile visibility.

3.15.2. Step-down Qualifications. Aircraft commanders and first pilots who are otherwise current but fail to meet the requirements of paragraph 3.14 may revert to first pilot or second pilot status, if they are current in their respective positions, until the "recent experience" provisions for aircraft commander are satisfied.

3.15.3. Multiple Currency. Pilots flying multiple types of aircraft who satisfy "all types" requirements may satisfy the "in type" currency requirement by flying a training flight with a flight instructor or examiner pilot. This training flight must include a minimum of two instrument approaches, three takeoffs, and three landings.

3.15.4. Night Landing Currency. Pilots not meeting the night-landing currency requirements of paragraph 3.14 shall not conduct night landings with passengers on board, but may be otherwise utilized, until the night-landing requirements are satisfied. Night-landing requirements may be accomplished in an approved visual, motion simulator.

3.15.5. Disqualification. Crew members delinquent in any recent experience requirement, except as modified above, are disqualified for passenger flights. Disqualification up to 3 months requires requalification in items deficient or a proficiency flight check with a flight examiner pilot. Disqualification over 3 months requires retraining in accordance with paragraphs 3.11 and 3.12 and a formal flight evaluation by a flight examiner pilot.

3.16. Evaluation Phase

3.16.1. The intent of the NASA flight crew evaluation program is to objectively evaluate aircrew performance and thereby measure the effectiveness of the training program. Designated flight examiners shall administer all flight checks.

3.16.2. Proficiency. Prior to being designated in their crew position, and annually thereafter, pilots must complete a proficiency evaluation flight conducted by a NASA- or FAA-designated flight examiner pilot. When maintaining qualifications in more than one type of aircraft, a proficiency evaluation flight in each aircraft is required annually. Except for the initial check, proficiency checks may be accomplished in an approved simulator by an FAA-designated examiner. Flight checks are considered overdue if not completed by the end of the month in which they are due. Pilots with overdue proficiency checks shall be scheduled only on training flights (i.e., non-passenger flights) with a qualified examiner or instructor pilot.

3.16.3. Line Checks. Prior to being designated an aircraft commander and annually thereafter, pilots must complete a line evaluation flight conducted by a flight examiner. When maintaining qualification in more than one type MMA, a line evaluation in each aircraft is required annually. The annual line check requirement may be conducted on typical passenger missions, in an FAA-approved simulator, or at an FAA-approved flight school. Pilots with overdue line checks shall not be scheduled as PIC until a check is completed.

3.16.4. Documentation. Flight checks conducted by NASA flight examiners shall be recorded on NASA Form 1615, reviewed by the Chief of Aircraft Operations, and filed in the individual's training file. Normally, all appropriate items indicated on the Form 1615 shall be evaluated during the flight checks. Flight examiners are urged to include meaningful remarks and recommendations on the NASA Form 1615. This shall aid in focusing future training on appropriate areas.

3.17. Coordination and Scheduling

3.17.1. The designated Senior Management official at NASA Headquarters and at NASA Centers, in addition to approving the use of MMA, shall --

3.17.1.1. Ensure that the most cost-effective MMA is used to satisfy approved requirements. Exceptions to this usage shall be documented in writing.

3.17.1.2. Coordinate trip itineraries and requirements with other NASA activities that could benefit from the use of available seats on each trip.

3.17.1.3. Ensure that trip documentation is maintained on file for a period of at least 24 months.

3.18. Crew Complement

3.18.1. General. All personnel scheduled as primary flight crew members on NASA MMA passenger flights shall be trained and qualified in accordance with paragraphs 3.9 through 4.6, inclusive, of this NPG. Crew assignment, including identification of pilot in command, shall be designated in writing for each flight.

3.18.2. Basic Crew. No aircraft carrying passengers shall be operated with less than the minimum basic crew specified below.

Gulfstream G-I, G-III -- Aircraft Commander and Co-pilot and Flight Maintenance Technician

King Air B-20 -- Aircraft Commander and Co-pilot

3.19. Crew Duty Time

3.19.1. Crew duty time is the total time a crew is on duty before the final termination of a flight. Crew duty time accrues consecutively and begins when a crew reports to a designated place of duty to start preparation for a flight and ends when the engines are cut at the end of the flight or series of flights. Crew duty shall normally commence at least 1 hour before scheduled departure time in order to provide adequate time for flight preparation. This does not preclude using personnel as crew members who commenced other duties before reporting for a flight; however, in this case the crew duty time for the entire crew begins when those other duties commenced.

3.19.2. Duty Time Limitations. Basic crew duty time shall not be scheduled to exceed 14 consecutive hours except as set forth below.

3.19.2.1. The Chief of Aircraft Operations may, for a particular flight, extend the basic crew duty time to 16 hours if the total time of crew duty is confined to the period between 4 a.m. and 12 midnight (local time at departure point). The aircraft must be pressurized and have a functional autopilot.

3.19.2.2. Augmented crews should be used only as a last resort when all other options, such as rescheduling or repositioning other crews, are not possible. Consideration should be given to limiting passenger load to ensure that an adequate crew rest capability is available. Augmented crew duty time shall not be scheduled to exceed 20 consecutive hours. The aircraft must be pressurized and have a functional autopilot. Flights requiring augmentation should be documented. The practice of using augmented crews applies to the G-III operation only.

3.19.2.3. Relief crews should be repositioned if the mission schedule cannot be supported within the duty time limitations specified for a single crew.

3.20. Crew Rest

3.20.1. Crew rest is provided to flight crew members in order to rest and eat. It includes crew transportation prior to participating in flight crew duties. Crew rest shall be provided prior to departure from the home station as well as at enroute stops when mission schedule or crew duty limitations prevent the aircraft from returning to the home station.

3.20.2. Crew Rest Limitations

3.20.2.1. Crew rest shall normally provide at least 10 consecutive hours free of all official duties.

3.20.2.2. At enroute stops, crew rest shall not normally commence until 1 hour after termination of the mission in order to allow for necessary postflight duties.

3.20.2.3. The crew rest period ends when the crew begins official duties in preparation for departure, normally at least 1 hour prior to scheduled takeoff time.

3.20.2.4. In exceptional circumstances, the Chief of Aircraft Operations may approve a reduced crew rest of no less than 8 hours total ground time, provided this time is confined between the hours of 8 p.m. and 8 a.m. local time. Approvals for reduced crew rest shall be limited to one occurrence per crew member during any 7-day period. Such approvals shall be documented and maintained on file for a period of 12 months.

3.20.2.5. Time accrued by any flight crew member traveling as passenger on an aircraft may not be credited to meet

any of the crew rest requirements of this chapter.

3.21. Maximum Flight Time Limitations

3.21.1. Flight crew members shall not be scheduled, nor permitted to function as members of NASA flight crews, if their total professional flying time exceeds the following flight hours:

Period	Flight Hours
Weekly	35 hours
Monthly	100 hours
Quarterly	300 hours
Yearly	1,000 hours

3.21.2. Flight crew members should be scheduled so that flight time is equitably distributed to meet individual training and proficiency requirements.

3.22. Hazardous Cargo

Hazardous material as defined in 49 CFR 171.8 shall not be transported in NASA MMA. Cargo to be shipped should be routed through the Center's transportation office before acceptance or, if enroute, cargo should normally only be accepted from a certified shipper or freight forwarding agency. Unaccompanied baggage shall be treated as cargo.

3.23. Cockpit Procedures

During all critical flight operations, cockpit activities shall be limited to those involved with the direct operation of the aircraft.

3.24. Crew Briefings

Before departure, the PIC shall brief the crew on all essential information concerning the flight including the duties and responsibilities of each flight crew member.

3.25. Planning Considerations

3.25.1. Passenger Loading. Normally, all engines and propellers shall be completely stopped when loading and unloading passengers or cargo from MMA. In those instances when, in the determination of the PIC, an extenuating circumstance requires the loading or unloading of passengers or cargo with an engine running, the following minimum precautions shall be followed:

3.25.1.1. Only the engine on the opposite side of the aircraft from the loading door may be operating and shall be operated at as low a power setting as practical.

3.25.1.2. The aircraft shall be parked so that passengers approaching or leaving the aircraft shall not walk in front of, nor behind, a rotating propeller nor in the vicinity of an operating turbo-jet engine.

3.25.1.3. A flight crew member shall be positioned on the ground to ensure that passengers do not approach close to an operating engine.

3.25.2. Passenger Briefings. The PIC shall ensure that all passengers have been briefed on the no smoking policy, use of seat belts, location and operation of appropriate emergency and survival equipment, and operation of doors and exits. This information shall be supplemented by printed passenger information cards. Tape recorded passenger briefings may be used, provided the sound reproduction is of high quality and provided a crew member is present in the cabin during the briefing to answer passenger questions.

3.25.3. Flight Planning. Thorough flight planning is essential to the safe and efficient conduct of mission management passenger flights. A flight plan shall be filed for each flight. Passenger flights shall be operated under instrument flight rules and, to the maximum extent possible, in controlled airspace; however, daylight flights of less than 100 nautical miles may be operated under visual flight rules if weather conditions permit. These flights must utilize radar advisory service to the maximum extent possible.

3.25.4. Fuel Planning. Considering weather forecasts and any known enroute delays, the minimum amount of useable fuel required at takeoff shall be sufficient to --

3.25.4.1. Complete the flight to the destination airport.

3.25.4.2. Fly from that airport to the alternate airport, if required.

3.25.4.3. Fly after that for 1 additional hour using normal cruise consumption at 16,000-feet mean sea level.

3.25.5. Weather Planning. Prior to takeoff, the PIC shall receive a thorough weather briefing concerning current weather and forecasts for the proposed route, destination, and alternate.

3.25.5.1. Departure Weather. Normally weather minimums for takeoff shall be not less than landing minimums appropriate for the aircraft equipment and for the airport facilities. However, if the urgency of the mission requires, as determined by the PIC, a takeoff may be made when the weather is below landing minimums but not less than 1/8 mile visibility or Runway Visual Range (RVR) of 800 feet and provided a suitable departure alternate is available within 100 nautical miles. The weather reported at the departure alternate must be at or above landing minimums and forecast to remain so for at least 2 hours after takeoff.

3.25.5.2. Enroute Weather. MMA shall not file a flight plan requesting clearance into areas of reported or forecast severe icing conditions. Operative airborne radar is required for any flight into areas where current weather reports or forecasts indicate that thunderstorms may reasonably be expected and flight under daylight visual meteorological conditions is not possible. Whenever possible, all flights shall be planned to circumnavigate areas of thunderstorm activity.

3.25.5.3. Destination Weather. MMA may file for a destination that forecasts prevailing visibility equal to or greater than published landing minimums appropriate to the aircraft equipment, but not less than 1/2 mile or RVR 1800 feet for time of arrival. If the destination weather is reported and forecast to be less than 2000-foot ceiling or less than 3-mile visibility from 1 hour before until 1 hour after the estimated time of arrival (ETA), an alternate airport shall be listed on the flight plan. Airport weather minimums shall meet or exceed the requirements of FAR Part 91.

3.25.5.4. New Aircraft Commanders. When the pilot has less than 100 hours PIC experience in the type (make and Model) aircraft being operated, the minimum descent altitude (MDA) or the decision height (DH) and visibility landing minimums are increased by 200 feet and 1/2 mile (or the RVR equivalent) for all instrument approaches conducted by that pilot. In no case may the landing minimums be less than 400-foot ceiling and 3/4-mile visibility. Similarly, takeoffs shall not be made if the airfield is below these adjusted landing minimums.

3.25.6. Preflight Inspections. Before each flight, the PIC shall ensure that the aircraft is in an airworthy condition. Required inspections should be accomplished and documented as soon as practical after reporting to operations.

3.25.6.1. Aircraft Logs. Prior to activating any aircraft system, NASA Form 1257, NASA Aircraft Log, and NASA Form 1260, MMA Delayed Discrepancy Form, shall be reviewed and evaluated. Prior to flight, the PIC shall accept the aircraft by signing NASA Form 1257. DoD aircraft forms or equivalent forms may be used as a substitute for the appropriate NASA forms.

3.25.6.2. Aircraft Visual Inspection. The aircraft visual external and internal preflight inspections shall be accomplished in accordance with the aircraft flight manual. At intermediate stops, as a minimum, an abbreviated walkaround inspection shall be conducted after each arrival and before each departure.

3.25.7. Aircraft Loading. The PIC shall ensure that the aircraft is limited to the maximum gross weight, zero fuel weight, maximum landing weight, and the center of gravity limits specified in the appropriate aircraft flight manual.

3.25.7.1. Weight and Balance Data. A copy of the current weight and balance data shall be carried aboard each MMA. It shall be used to determine that the weight and center of gravity shall remain within limits for the duration of each flight.

3.26. Takeoff and Departure Procedures

3.26.1. Use of Navigational Aids (NAVAIDS) and Electronic Equipment. All available NAVAIDS shall be used from departure to landing. On departure, NAVAIDS shall be set up to aid in a possible expedited emergency return as well as to aid in establishing the initial enroute course.

3.26.1.1. Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR). If installed and operative, the CVR and FDR shall be turned on during the entire flight.

3.26.1.2. Ground Proximity Warning System (GPWS). The GPWS shall be used on all flights. If the equipment tests satisfactorily prior to takeoff, it shall be assumed that any GPWS warning is valid unless the aircraft position can immediately and positively be verified by visual reference. Immediate and appropriate action shall be taken to all valid GPWS warning calls.

3.26.1.3. Landing Lights. Maximum use of landing lights is encouraged during all takeoffs and landings and when operating near airports or in high-density traffic areas.

3.26.2. Outside Vigilance. The PIC is responsible for ensuring that, during visual conditions, at least one person maintains a lookout for conflicting traffic at all times. Unnecessary paperwork shall not be accomplished in the cockpit during aircraft climbs or descents.

3.26.2.1. Use of Autopilot. To aid in outside vigilance during flight in visual conditions, maximum use of the flight director system, coupled to the autopilot, is encouraged. However, on takeoff, the autopilot shall not be engaged at less than 500 feet above the terrain.

3.26.2.2. Outside Observer. Use of any additional crew members to aid in outside vigilance is highly encouraged, particularly while operating in visual conditions in heavy traffic areas. Flight maintenance technicians shall normally remain at their duty station throughout the climb and descent. Their cabin duties shall be considered secondary in importance during these times.

3.27. Enroute Procedures

3.27.1. Crew members at Station. Both pilot and copilot must remain at their duty stations with seat belts fastened while the aircraft is taxiing, taking off, landing, and while enroute unless absence is necessary for the performance of their duties or in connection with physiological needs.

3.27.2. Passenger Considerations. The PIC is responsible for the safety and comfort of the passengers and should make every reasonable effort to keep the senior passenger or trip coordinator apprised of any significant deviations from the itinerary or schedule. In-flight delays and readily discernible abnormal conditions should be explained to the passengers.

3.27.2.1. Safety Belts. The PIC shall ensure that all passengers and crew members have safety belts securely fastened for taxiing, takeoffs, landings, and before entering an area of in-flight turbulence.

3.27.2.2. Admission To The Flight Deck. Passengers shall not be admitted to the flight deck during the taxi, takeoff, climb, descent, and landing phase of flight. However, at other times, at the discretion of the PIC, visits to the flight deck by NASA passengers should be encouraged.

3.27.3. In-Flight Meals. Food requiring cooking shall not be prepared in-flight aboard MMA. Food for passengers and crew normally shall be purchased from a commercial, NASA, or military food service facility.

3.27.4. Flight Progress. The PIC shall ensure that the aircraft's progress is continually monitored. This includes the progressive following of the aircraft's positions, fuel consumption, and the updating of enroute, destination, and alternate weather.

3.27.5. Minimum Fuel. The PIC shall notify ATC of the aircraft "minimum fuel" status at any time the fuel supply has reached a quantity where, upon reaching destination, little or no delay can be accepted. In no case may this quantity be less than that specified in paragraph 3.30.4. If fuel remaining indicates a need for traffic priority to ensure a safe landing, the PIC shall formally declare an emergency due to low fuel and shall report fuel remaining in minutes.

3.27.6. Emergency Procedures. When an emergency or in-flight difficulty arises, the PIC shall complete the appropriate checklists and report the nature and extent of the difficulty, intentions, assistance required to the controlling ground agency. In the event of an engine failure or shut down, the PIC shall land at the nearest suitable airport at which a safe landing can be made.

3.28. Arrival, Approach, and Landing Procedures

3.28.1. General. During instrument arrivals, all available navigational aids shall be used. When available, precision approach guidance (Instrument Landing System or Precision Approach Radar) shall be used for all night arrivals except training flights.

3.28.2. Weather Minimums. No pilot operating an aircraft may land that aircraft when the flight visibility is less than the visibility prescribed in the standard instrument approach procedure being used.

3.28.3. Destination Below Minimum. If the destination weather is marginal or below minimums, the PIC may proceed to a suitable alternate or may hold if the destination weather is forecast to improve and fuel for alternate and reserve requirements shall not be compromised. The weather at the alternate must be at or above alternate minimums and forecast to remain so until the new ETA plus 1 hour.

3.28.4. Approach Briefing. Before starting an approach, the pilot flying shall brief the crew on the procedures to be followed during the approach and landing and in the event of a missed approach. The briefing shall include a review of the procedure to be flown, including key altitudes and restrictions as well as specific crew duties during the approach and landing.

3.28.5. Approach Progress. The pilot making the approach shall announce his/her progress and intentions periodically. The pilot not flying shall monitor the approach and provide a continual cross-check of the navigational aids, instruments, air traffic control instructions, and approach procedures. Any deviations from the prescribed procedure shall immediately be brought to the attention of the pilot flying. The pilot not flying shall call out, "1000 feet above," and "100 feet above," all key altitudes as well as "minimums" upon reaching the appropriate Minimum Descent Altitude (MDA) or Decision Height (DH). When the runway is in sight, the pilot not flying shall state, "runway in sight." If the runway is not in sight when the aircraft reaches the missed approach point, the pilot not flying shall state, "go around."

3.28.6. Use of Autopilot. Use of the autopilot during arrivals, descents, and approaches is encouraged particularly during visual flight conditions as an aid in collision avoidance. In order to prevent excessive loss of altitude in the event of an autopilot failure, the pilot directing the aircraft shall maintain light control contact throughout the final portion of an automatic coupler approach. Full manual control shall be assumed at or above published minimum altitude.

3.28.7. Canceling Instrument Flight Plans. Normally, instrument flight plans shall not be canceled prior to landing.

3.29. Postflight Procedures

3.29.1. Closing Flight Plan. On completion of the flight, the PIC shall ensure the flight plan is closed with the appropriate facility.

3.29.2. Aircraft Security. The PIC must take prudent measures to secure and protect the aircraft at enroute stops. These measures must preclude unnecessary exposure to weather, such as high winds and freezing precipitation, and must also provide a reasonable degree of security from such activities as vandalism, theft, or terrorism. At any time the aircraft is unattended by a member of the crew during enroute stops, it shall be locked. At overnight stops, instructions for locating the crew should be left with the fixed base operator, base operations, or other airport authority.

3.29.3. Aircraft Flight Logs. The PIC shall enter, or have entered, in the aircraft flight log each mechanical irregularity discovered during the flight. All unusual events (e.g., overweight or hard landings, lightning or bird strike, static discharge, and flight through hail or severe turbulence) shall be recorded in the aircraft log.

3.30. Specific Operational Restrictions

3.30.1. Appropriate aircraft flight manual data shall be utilized to assure adequate takeoff, climb, approach, and landing performance is available for the actual conditions to be encountered. Additional restrictions, as outlined in the tables below, are established to assure a prudent level of safety during routine line operations.

3.30.2 Following are the minimum runway lengths to be used for the aircraft shown in the table.

Minimum Runway Length

<u>Aircraft</u>	<u>Runway</u>
King Air B200	3500 ft.
Gulfstream I	4000 ft.
Gulfstream II/III	6000 ft.

3.30.3. Wind Restrictions. For normal operations, airfields shall be considered below minimums for takeoff and landing when winds, including gusts, are greater than those established below:

Wind Restrictions

Aircraft	Maximum Component	Tailwind Component *	Crosswind

King Air B200	45 kts	10 kts	20 kts
Gulfstream -I	45 kts	10 kts	20 kts
Gulfstream-III	40 kts	10 kts	20 kts
		* On wet runways, maximum tailwind component is 1/2 the value shown	

3.30.4. Minimum Fuel For Landing. Minimum fuel for landing is established in recognition of three factors: (1) fuel required to execute an unanticipated go-around and traffic pattern; (2) Fuel required for landing, rollout; and (3) allowance for fuel quantity measuring system error. All flights shall be planned so as to have no less than the following minimum indicated fuel available at touchdown on the final landing:

Minimum Landing Fuel

Aircraft	Minimum Landing Fuel
King Air B200	400 pounds
Gulfstream-I	1000 pounds
Gulfstream-III	2500 pounds

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